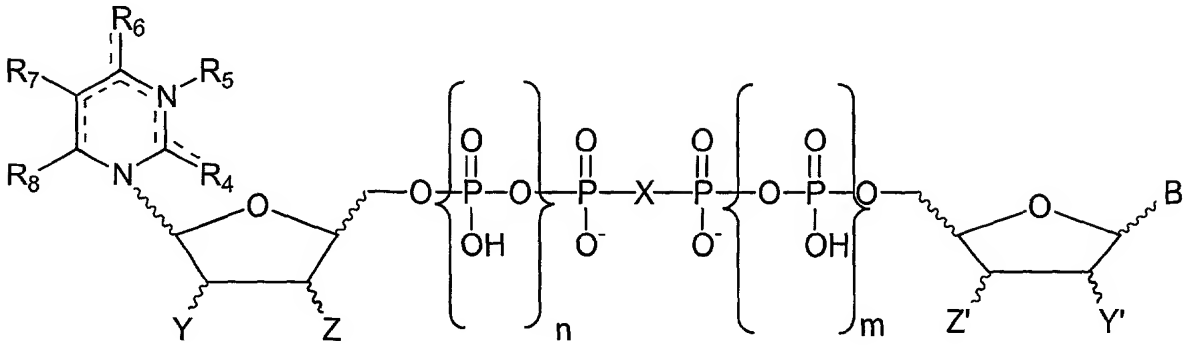
WHAT IS CLAIMED IS:

1. A compound of Formula IIIA:

Formula IIIA



wherein:

X is oxygen, methylene, difluoromethylene, imido;

n = 0, 1, or 2;

m = 0, 1, or 2;

n + m= 0, 1, 2, 3, or 4;

B is a purine or a pyrimidine residue linked through the 9- or 1-position, respectively;

Z = OH or N_3;

Z' = OH or N_3;

Y = H or OH;

Y' = H or OH;

provided that when Z is N_3, Y is H or when Z' is N_3, Y' is H;

R_4 is oxo, amino, cyano, aralkoxy, C_{1-6} alkoxy, C_{1-6} alkylamino, or dialkylamino;

R_5 is hydrogen, acyl or benzoyl, C_{1-6} alkyl, phenyloxy, C_{1-5} alkanoyl or absent;

R_6 is oxo, hydroxy, mercapto, C_{1-4}alkoxy, C_{7-12}arylalkoxy, C_{1-6}alkylthio, amino, C_{1-5} disubstituted amino, triazolyl, C_{1-6}alkylamino or di-C_{1-4}alkylamino, where the alkyl groups is optionally linked to form a heterocycle or link to N^3 to form a substituted ring; or

R_5 and R_6 taken together form a 5-membered fused imidazole ring between positions 3 and 4 of the pyrimidine ring, which is optionally substituted on the 4- or 5- positions of the etheno moiety with C_{1-4}alkyl, phenyl, or phenyloxy, which themselves are optionally substituted;

R_7 is hydrogen, hydroxy, cyano, nitro, C_{2-8}alkenyl, C_{1-4}alkyl, phenyl, substituted C_{2-8}alkynyl, halogen, C_{1-4}alkyl, substituted C_{1-4}alkyl, CF_3, C_{2-6} alkyl, C_{2-3} alkenyl, allylamino, bromvinyl, ethyl propenoate, propenoic acid, C_{2-3} alkynyl, substituted C_{2-3}alkynyl; or

R_6 and R_7 taken together form a 5 or 6-membered saturated or unsaturated ring bonded through N or O at R_6, such ring optionally contain substituents that themselves contain functionalities;

R_8 is hydrogen, amino or di-C_{1-4}alkylamino, C_{1-4}alkoxy, C_{7-12}arylalkoxy, C_{1-4}alkylthio, C_{7-12}arylalkylthio,carboxamidomethyl, carboxymethyl, methoxy, methylthio, phenoxy or phenylthio; provided that when R_8 is amino or substituted amino, R_7 is hydrogen;

provided that when B = adenine, adenine 1-oxide, or $1,N^6$-ethenoadenine, then:

(a) $R_6 \neq$ oxo when R_4 = oxo, Y = Z = OH and $R_5 = R_7 = R_8$ = H;

(b) $R_7 \neq$ Br when $R_4 = R_6$ = oxo, Y = Z = OH, and $R_5 = R_8$ = H;

provided that when B = adenine, then:

(a) $R_6 \neq$ amino when R_4 = oxo, Y = Z = OH, R_5 is absent, $R_7 = R_8$ = H, and n + m = 0, 1, or 2;

(b) $R_7 \neq CH_3$ when $R_4 = R_6$ = oxo, Y = H, Z = OH, and $R_5 = R_8$ = H;

(c) $R_7 \neq$ F when $R_4 = R_6$ = oxo, Y = H, Z = OH, $R_5 = R_8$ = H and n + m = 2;

provided that when B = thymine, Y'= H and Z' = N_3; then $R_7 \neq$ F, when $R_4 = R_6$ = oxo, Y = OH, Z = OH, $R_5 = R_8$ = H, and n + m =0;

provided that when B = thymine, Y' = H and Z' = N_3; then $R_7 \neq CH_3$ when $R_4 = R_6$ = oxo, Y = H, Z = N_3, $R_5 = R_8$ = H, and n + m =0;

provided that when B = guanine, then:

(a) $R_6 \neq$ oxo when R_4 = oxo, Y = Z = OH, $R_5 = R_7 = R_8$ = H and n + m =1 or 2;

(b) $R_6 \neq$ amino when R_4 = oxo, Y = Z = OH, R_5 is absent, $R_7 = R_8$ = H, n+m=1 or 2;

provided that when B is uridine, or 5-Br-uridine, then

(a) $R_6 \neq$ oxo when R_4 = oxo, Y = Z = OH and $R_6 = R_7 = R_8$ = H;

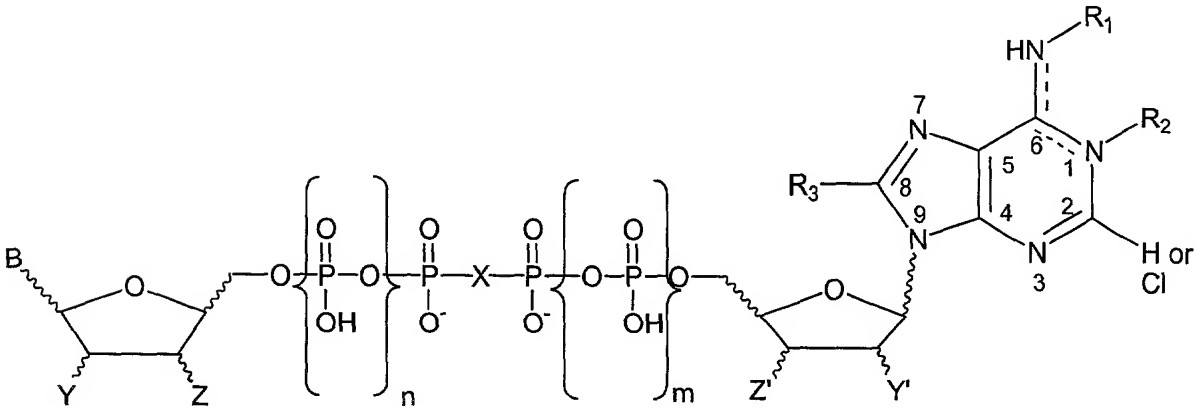
(b) $R_7 \neq$ Br when $R_4 = R_6$ = oxo, Y = Z = OH, and $R_5 = R_8$ = H;

provided that when B is 5-FU, then $R_7 \neq$ F, when $R_4 = R_6$ = oxo, Y = H, Z = OH, $R_5 = R_8$ = H, and n + m= 0;

provided that when B is cytosine, then $R_6 \neq$ amino, when R_4 = oxo, Y = Z = OH, R_5 is absent, $R_7 = R_8$ = H, and n + m = 1, or 2; and

provided that when B is cytosine, then $R_6 \neq$ oxo, when R_4 = oxo, Y = Z = OH and $R_6 = R_7 = R_8$ = H, and n + m =2.

2. A compound according to Formula IIA:



Formula IIA

wherein:

X is oxygen, methylene, difluoromethylene, imido;

n = 0, 1, or 2;

m = 0, 1, or 2;

n + m= 0, 1, 2, 3, or 4;

B is a purine residue linked through the 9- position;

Z = OH or N_3;

Z' = OH or N_3;

Y = H or OH;

Y' = H or OH;

provided that when Z is N_3, Y is H or when Z'is N_3, Y' is H;

R_1 is H, C_{1-8}alkyl, phenyl or phenyloxy, optionally substituted with halogen, hydroxy, C_{1-4}alkoxy, C_{1-4}alkyl, C_{6-10}aryl, carboxy, cyano, nitro, sulfonamido, sulfonate, phosphate, sulfonic acid, amino or substituted amino, wherein the amino is singly or doubly substituted by a C_{1-4} alkyl and when doubly substituted, the alkyl groups are optionally linked to form a heterocycle; or A(C_{1-6}alkyl)CONH(C_{1-6}alkyl)B wherein A and B are amino, mercapto, hydroxy or carboxyl;

R_2 is O or is absent; or

R_1 and R_2 taken together forms a 5-membered fused imidazole ring, which is optionally substituted on the 4- or 5- positions of the etheno moiety with C_{1-4}alkyl, phenyl or phenyloxy, optionally substituted with halogen, hydroxy, C_{1-4}alkoxy, C_{1-4}alkyl, C_{6-10}aryl, arylalkyl, carboxy, cyano, nitro, sulfonamido, sulfonate, phosphate, sulfonic acid, amino or substituted amino, wherein the amino is singly or doubly substituted by a C_{1-4} alkyl and when doubly substituted, the alkyl groups is optionally linked to form a heterocycle; and

R_3 is H, C_{1-8}alkyl, phenyl or phenyloxy, optionally substituted with halogen, hydroxy, C_{1-4}alkoxy, C_{1-4}alkyl, C_{6-10}aryl, carboxy, cyano, nitro, sulfonamido, sulfonate, phosphate, sulfonic acid, amino or substituted amino, wherein the amino is singly or doubly substituted by a C_{1-4} alkyl and when doubly substituted, the alkyl groups is optionally linked to form a heterocycle; C_{7-12}arylalkyl; C_{1-4}alkylamino, phenylamino, C_{7-12}arylalkylamino, C_{1-4}alkoxy, or C_{7-12}arylalkyloxy; C_{1-4}alkylthio, phenylthio, C_{7-12}arylalkylthio, or -A(C_{1-6}alkyl)CONH(C_{1-6}alkyl)B- wherein A and B are independently

amino, mercapto, hydroxy or carboxyl;

provided that $R_1 \neq H$, when X is oxygen, methylene, or difluoromethylene, Y is OH, B is adenine, R_2 is absent, and R_3 is hydrogen;

provided that $R_1 \neq H$, when $n + m = 2$, X is oxygen, Y is OH, B is adenine, R_2 is absent, and R_3 is bromo, or 6-aminohexyl;

provided that $R_1 \neq H$, when $n + m = 2$, X is oxygen, Y is H, B is adenine, R_2 is absent, and R_3 is H;

provided that $R_2 \neq O$, when $n + m = 2$, X is oxygen, Y is OH, $R_1 = R_3 = H$, and B is adenine, adenine 1-oxide, or $1,N^6$-ethenoadenine;

provided that R_1 and R_2 do not form a 5-membered fused imidazole ring, when $n + m = 2$, X is oxygen, Y is OH, R_3 is H, and B is adenine, adenine 1-oxide, or ethenoadenine.

3. The compound according to Claim 1 or 2, wherein the ribosyl moieties are in the D- configuration.

4. The compound according to Claim 1 or 2, wherein the ribosyl moieties are in the L- configuration.

5. A pharmaceutical composition comprising a compound of Formula IA or IB as described in Claim 1 or 2, or a pharmaceutically acceptable salt therof together with a pharmaceutically acceptable carrier therefor.

6. A method of treating chronic obstructive pulmonary diseases in a mammal by administering an effective chronic obstructive pulmonary disease treatment amount of a compound of Formula IA or IB as described in Claim 1 or 2.

7. A method of treating sinusitis, otitis media or nasolacrimal duct obstruction in a mammal by administering an effective mucus secretion clearing amount of a compound of Formula IA or IB as described in Claim 1 or 2.

8. A method of treating dry eye in a mammal by administering an effective dry eye treatment amount of a compound of Formula IA or IB as described in Claim 1 or 2.

9. A method of treating retinal detachment in a mammal by administering an effective retinal detachment treatment amount of a compound of Formula I as described in Claim 1 or 2.

10. A method of facilitating sputum induction in a mammal by administering an amount of a compound of Formula IA or IB as described in Claim 1 or 2, effective to facilitate sputum induction.

11. A method of facilitating expectoration in a mammal by administering an amount of a compound of Formula IA or IB as described in Claim 1 or 2, effective to facilitating expectoration.